REMARKS/ARGUMENTS

Support for the Amendment

The amendment to page 7 of the specification is a correction of a typographical error that does not appear to have been corrected previously. The amendment to the claims are primarily matters of clarification, elimination of redundancies, correction of errors in antecedent basis, and the substitution of alternative yet equivalent terms. For example, "gas generating tank" has been replaced by "hydrogen gas generation vessel," and "liquid holding tank" has been replaced by "holding vessel." The characterization of the solution of hydroxide ion as an aqueous solution finds support in the specification at page 7, line 24, which cites "a mixture of water and potassium hydroxide." The amendment also reduces the reaction system to one that is limited to the reaction between aluminum metal and aqueous hydroxide ion, by using the expression "consisting of" in the first line of subparagraph (a) of claim 21. Support for "aluminum metal" in the application as filed is found in the various references to aluminum tubes and rods throughout the specification, notably at page 4, third line from the bottom of the page, and at page 8, lines 8 and 18 from the top of the page. No new matter is presented by this amendment.

Specification

The objection raised in this section is actually an objection to claim 36 rather than to the specification, but it has been addressed by eliminating the offending expression entirely.

Claim Rejections -- 35 USC § 103

The rejection of claims 21-23, 25-33, and 37-38 over the combination of Gallagher (US 3,895,102) and Molter (US 4,818,637) is respectfully traversed. With the amendment to claim 21, the present invention is now limited to the reaction between aluminum metal and aqueous hydroxide, whereas the Gallagher disclosure is directed to the reaction between caustic and a silicon-containing metal, using ferrosilicon as the silicon-containing metal. The various sub-reactions in the overall reaction of Gallagher are shown in column 1, lines 18-20. Even though the reaction materials used by Gallager include a wafer that contains

aluminum, the main reactant in the wafer is the ferrosilicon and this is indeed the subject and focus of the Gallagher disclosure. As the examiner will recognize, the reaction system of Gallagher is of different reaction dynamics than that of the present invention and is sufficiently distinct that a disclosure of operating conditions for the former does not serve as a suggestion of the same or similar operating conditions for the latter. There is no suggestion from Gallagher of how to conduct a reaction between aluminum metal and hydroxide ion without the additional presence of a silicon-containing metal.

In reference to the temperature claimed by Applicant, the examiner has pointed to column 4, line 24-28 of Gallagher. The maximum temperature disclosed in that section is 80°C, which is equivalent to 176°F. This is below Applicant's claimed temperature of 180°, and even though Applicant's claim language recites this temperature as "*approximately* 180 degrees Fahrenheit," the disclosure does not suggest performing the reaction between aluminum metal and hydroxide ion at this temperature, since the Gallagher temperature range refers to a different reaction, *i.e.*, the reaction between a silicon-containing metal and hydroxide ion. The only reference that discloses the same reaction as that cited by applicant is the von Sturm *et al.* patent (US 3,574,560), which cites no temperature at all and in fact, as explained below, teaches away from the reaction conditions recited in Applicant's claims.

Molter has been cited for its disclosure of humidifying hydrogen gas prior to introducing it into a hydrogen/halogen fuel cell. While Molter does include such a disclosure, it does not otherwise provide the elements lacking from the Gallagher disclosure. Like Gallagher, Molter fails to address the reaction between aluminum metal and hydroxide ion and thus offers no suggestion of how this reaction might be conducted. Indeed, Molter discloses nothing at all about processes for generating hydrogen gas.

The rejection of claims 24 and 39-40 over the combination of Gallagher (US 3,895,102), Molter (US 4,818,637), von Sturm *et al.* (US 3,574,560), and Richman (US 3,669,741) is likewise respectfully traversed. These claims all depend from claim 21, either directly or through an intervening claim, and as noted above, neither the Gallagher nor the

Molter disclosures address or even mention the reaction recited in claim 21. Von Sturm *et al.* is the only reference in this group that addresses a reaction system containing the two reactants cited in Applicant's claims, but von Sturm *et al.* fail to disclose the temperature, or the use of the temperature in a system in which the aluminum metal is fully immersed in the aqueous solution. The aluminum shown in von Sturm *et al.* is in the form of aluminum rods, and unlike Applicant's system as claimed, the liquid level used by von Sturm *et al.* is maintained below the tops of the rods. As for temperature, von Sturm *et al.* disclose *raising* the liquid level only when the temperature is *lowered.* Applying this teaching to the disclosure of Gallagher, which is unlikely since they address two different reactions, would clearly suggest to one skilled in the art that one should *lower* the operating temperature of Gallagher, or at least operate toward the lower end of the range, if one were to fully immerse the aluminum rods of von Sturm *et al.* in the lye solution, as Applicant claims. The combined teachings of these references thus point the skilled artisan in the direction opposite to that of the present invention.

Richman is cited for its disclosure of periodically opening the tank to replace the fuel tubes. As in Gallagher, however, Richman discloses a reaction system that differs fundamentally from that of Applicant by requiring the inclusion of silicon in the reaction mixture to produce the hydrogen gas. Furthermore, Richman cites a temperature significantly above that claimed by Applicant (see column 11, lines 10-12 of Richman), offering no suggestion of the lower temperature. Even if it did suggest a temperature 15 degrees lower, the suggestion would not be transferable to Applicant's reaction, since Applicant's reaction does not form potassium aluminum silicate (column 2, lines 45-50 of Richman).

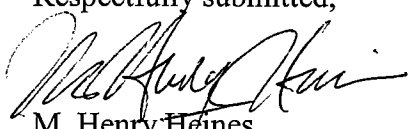
The rejection of claims 34-36 over the combination of Gallagher (US 3,895,102), Molter (US 4,818,637), and Knowlton *et al.* (US 2001/0013321 A1) is likewise respectfully traversed. Applicant recognizes that Knowlton *et al.* is cited for its disclosure of condensing water from an engine exhaust and recycling the condensed water to the hydrogen generator. The rejected claims depend from claim 21, however, either directly or through an intervening claim, and none of the three references in this group disclose the reaction system of claim 21. The

hydrogen generation reaction in Knowlton *et al.* is a reaction between water and a hydrocarbon fuel. Neither caustic nor aluminum metal are present in the system.

CONCLUSION

In view of the foregoing, reconsideration of the application is respectfully requested. Should any matters remain that can be resolved by a conference with Applicant's attorney, the examiner is invited to telephone the undersigned at 415-576-0200.

Respectfully submitted,



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